

What is Claimed is:

- 1 1. An endoluminal prosthesis, comprising:
  - 2 an tubular substrate having an abluminal surface and a luminal surface thereof;
  - 3 and
  - 4 a wire member fabricated of an elastically deformable and elastically recoverable
  - 5 material circumferentially disposed about and adhered to the abluminal surface of the tubular
  - 6 substrate by adhesive means interfacing between the wire member and the tubular substrate.
- 1 2. The endoluminal prosthesis according to Claim 1, wherein the elastically deformable and
- 2 elastically recoverable material of the wire member is selected from the group of materials
- 3 consisting of shape memory alloys, biocompatible spring steels, biocompatible spring metal
- 4 alloys, and carbon fibers.
- 1 3. The endoluminal prosthesis according to Claim 2, wherein the shape memory alloys
- 2 further comprise nickel-titanium alloys.
- 1 4. The endoluminal prosthesis according to Claim 2, wherein the wire member further
- 2 comprises a shape memory alloy which a pre-programmed austenite dimensional state which is
- 3 substantially the same diametric dimension as the diametric dimension of the tubular-shaped
- 4 substrate.
- 1 5. The endoluminal prosthesis according to Claim 1, further comprising a polymeric
- 2 cladding concentrically surrounding the wire member, the cladding being in intimate contact
- 3 with and joined to the abluminal surface of the tubular-shaped substrate.
- 1 6. The endoluminal prosthesis according to Claim 5, wherein the adhesive means further
- 2 comprises a polymeric covering on the wire member and is selected from the group consisting of
- 3 polytetrafluoroethylene, polyurethane, polyethylene, polypropylene, polyamide, polyimide,
- 4 polyesters, polypropylene, polyethylene, polyfluoroethylenes, silicone, fluorinated polyolefins,

5 fluorinated ethylene/propylene copolymer, perfluoroalkoxy fluorocarbon,  
6 ethylene/tetrafluoroethylene copolymer, and polyvinylpyrrolidone.

1 7. The endoluminal prosthesis according to Claim 1, wherein the tubular-shaped substrate  
2 further comprises a biocompatible material selected from the group consisting of expanded  
3 polytetrafluoroethylene, polyethylene, polyethylene terephthalate, polyurethane, and collagen.

1 8. An endoluminal prosthesis comprising a support wire member joined to a planar  
2 expanded polytetrafluoroethylene film member, the support wire member and planar expanded  
3 polytetrafluoroethylene film member being helically wound into an open cylindrical  
4 configuration with adjacent windings forming overlapping regions of the expanded  
5 polytetrafluoroethylene film member bonded to one and other.

1 9. The endoluminal prosthesis according to Claim 8, further comprising a planar  
2 polytetrafluoroethylene film member in intimate contact with and monolithically joined to the  
3 planar expanded polytetrafluoroethylene film member, the support wire member being  
4 intermediate the second planar expanded polytetrafluoroethylene film member and the planar  
5 expanded polytetrafluoroethylene film member.

1 10. The endoluminal prosthesis according to Claim 8, further comprising a bonding agent  
2 joining the support wire member and the planar expanded polytetrafluoroethylene film member.

1 11. The endoluminal prosthesis according to Claim 9, further comprising an adhesive  
2 interlayer interdisposed between the planar polytetrafluoroethylene film member and the planar  
3 expanded polytetrafluoroethylene film member.

1 12. The endoluminal prosthesis according to Claim 9, wherein the planar  
2 polytetrafluoroethylene film member further comprises expanded polytetrafluoroethylene.

1       13. The endoluminal prosthesis according to Claim 10, wherein the adhesive material is  
2       selected from the group consisting of polytetrafluoroethylene, polyurethane, polyethylene,  
3       polypropylene, polyamide, polyimide, polyesters, polypropylene, polyethylene,  
4       polyfluoroethylenes, silicone, fluorinated polyolefins, fluorinated ethylene/propylene copolymer,  
5       perfluoroalkoxy fluorocarbon, ethylene/tetrafluoroethylene copolymer, and polyvinylpyrrolidone.

1       14. The endoluminal prosthesis according to Claim 10, wherein the bonding agent is  
2       disposed intermediate the wire member and an abluminal wall surface of polytetrafluoroethylene  
3       tubular substrate.

1       15. The endoluminal prosthesis according to Claim 10, wherein the bonding agent further  
2       comprises a concentric cladding surrounding the wire member.

1       16. An endoluminal prosthesis, comprising:  
2           a expanded polytetrafluoroethylene tubular-shaped substrate; and  
3           a wire member fabricated of a shape memory alloy helically wound about and adhered to  
4           an abluminal surface of the expanded polytetrafluoroethylene tubular-shaped substrate.

1       17. The endoluminal prosthesis according to Claim 16, wherein the shape memory  
2       stent further comprises a nickel-titanium alloy.

1       18. The endoluminal prosthesis according to Claim 17, wherein the nickel-titanium  
2       alloy further comprises an alloy consisting essentially of nickel present at about 50 at. %,  
3       titanium present at about 50 at. %.

1       19. The endoluminal prosthesis according to Claim 16, wherein the wire member has  
2       a pre-programmed austenite dimensional state which is substantially the same diametric  
3       dimension as the diametric dimension of the expanded polytetrafluoroethylene tubular-shaped  
4       substrate.

1 20. The endoluminal prosthesis according to Claim 16, further comprising a  
2 polymeric cladding concentrically surrounding the wire member, the cladding being in intimate  
3 contact with and joined to the abluminal surface of the tubular-shaped substrate.

1 21. The endoluminal prosthesis according to Claim 20, wherein the polymeric  
2 covering is selected from the group consisting of polytetrafluoroethylene, polyurethane,  
3 polyethylene, polypropylene, polyamide, polyimide, polyesters, polypropylene, polyethylene,  
4 polyfluoroethylenes, silicone, fluorinated polyolefins, fluorinated ethylene/propylene copolymer,  
5 perfluoroalkoxy fluorocarbon, ethylene/tetrafluoroethylene copolymer, and polyvinylpyrrolidone.

1 22. A method for making an endoluminal prosthesis, comprising the step of wrapping  
2 a wire member made of a shape memory alloy about and in intimate bonded contact with an  
3 abluminal surface of a seamless expanded polytetrafluoroethylene tubular member.

1 23. The method for making an endoluminal prosthesis according to Claim 22, further  
2 comprising the step of providing the wire member with a concentric cladding fabricated of a  
3 material capable of bonding to the expanded polytetrafluoroethylene tubular member.

1 24. The method for making an endoluminal prosthesis according to Claim 23, wherein the  
2 step of providing the wire member with a concentric cladding further comprises the step of  
3 selecting a cladding material from the group consisting of polytetrafluoroethylene, polyurethane,  
4 polyethylene, polypropylene, polyamide, polyimide, polyester, polyfluoroethylenes, silicone,  
5 fluorinated polyolefin, fluorinated ethylene/propylene copolymer, perfluoroalkoxy fluorocarbon,  
6 ethylene/tetrafluoroethylene copolymer, and polyvinylpyrrolidone.

1 25. The method for making an endoluminal prosthesis according to Claim 24, wherein the  
2 step of providing the wire member further comprises the steps of co-extruding the wire member  
3 with a polytetrafluoroethylene cladding.

1       26. The method for making an endoluminal prosthesis according to Claim 25, further  
2 comprising the steps of applying a helical wrapping of polytetrafluoroethylene tape  
3 circumferentially about the expanded polytetrafluoroethylene tubular substrate and the wire  
4 member co-extruded with the polytetrafluoroethylene cladding and along an entire longitudinal  
5 extent of the expanded polytetrafluoroethylene tubular substrate thereby radially and  
6 longitudinally securing the expanded polytetrafluoroethylene tubular substrate and sintering the  
7 assembly at a temperature above the crystalline melt point of polytetrafluoroethylene and for a  
8 period of time sufficient to bond the polytetrafluoroethylene cladding to the expanded  
9 polytetrafluoroethylene substrate.

1       27. The method for making an endoluminal prosthesis according to Claim 24, further  
2 comprising the step of heating the expanded polytetrafluoroethylene tubular substrate and the  
3 concentrically clad wire member to a temperature above the melt point of the bonding agent for a  
4 period of time sufficient to mechanically bond the concentrically clad wire member to the  
5 abluminal surface of the polytetrafluoroethylene tubular substrate.

1       28. The use of an intraluminal prosthesis according to Claim 1 for bypass of an anatomical  
2 conduit.

1       29. The use of an intraluminal prosthesis according to Claim 1 for creating an arterio-venous  
2 shunt.

1       30. The use of an intraluminal prosthesis according to Claim 23 for creating a transluminal  
2 intrahepatic portosystemic shunt.

1       31. The use of an intraluminal prosthesis according to Claim 1 as an intraluminal support  
2 structure for maintaining luminal patency.

1       32. The use of an intraluminal prosthesis according to Claim 25 further comprising the use  
2 for restoring luminal patency in an anatomical fluid conduit.